

# THE NATURAL HISTORY OF THE MARRON AND OTHER FRESH WATER CRAYFISHES OF SOUTH-WESTERN AUSTRALIA

By BRUCE SHIPWAY, South Perth.

## PART 1.

### 1.—INTRODUCTION.

At the request of the Superintendent of Fisheries (Mr. A. J. Fraser), and financially assisted by a grant from the Commonwealth Science and Industry Endowment Fund, the writer is conducting an investigation into the bionomics of the Marron. This creature, from the economic point of view, is the most important fresh water crayfish in Australia. It is still plentiful, and its extremely palatable flesh is considered by many to be superior in flavour and texture to the marine crayfishes. Experiments in preservation of the flesh resulted in a pack which was less dry and stringy than its marine equivalent.

The edible portion, the abdomen (or "tail") is larger in proportion to the rest of the body, the carapace, than in the other species of large fresh water crayfish which occur in Australasia.

### 2.—SPECIES AND IDENTIFICATION.

At least three distinct species of fresh water crayfish are positively known to occur in South-western Australia. To most people fishing for these crustaceans the large specimens are known as Marron and the small ones, indiscriminately, as Jilgies. The aboriginals, from whom we adopt the vernacular names, were, however, well aware of three separate species, and called the third Koonac.

It is not my intention to enter on a detailed discussion into the correct nomenclature of these species, and the names used by A. R. McCulloch (1914) have been adopted, as these are in most general usage. Anyone desirous of studying the systematics of the group will be confronted with a considerable literature on the subject not readily accessible.

The three Western Australian species mentioned afford an illustration of the serviceability of the native names: *they* have remained constant, whereas the scientific appellations have been changed in nearly every review of the species.

All three are members of the genus *Cheraps*\* Erichson (1846) and for them McCulloch accepts the names, *C. tenuimanus* Smith (1912), the Marron; *C. quinquecarinatus* Gray (1845), the Jilgie; *C. preissii* Erichson (1846), the Koonac with its doubtful sub-species *C. preissii angustus* McCulloch (1914).

---

\*The "correction" by E. Clark (1936) of this name to *Cherax* is an ultra-zealous and scarcely warranted application of the "original spelling" rule and the reasons given are hardly sufficient to dislodge a well-established name.

Some workers, notably G. W. Smith (1912), report a fourth species occurring in South-western Australia—*Parachaeraps bicarinatus* (Gray, 1845),\* the Yabbie. However, the Western Australian Museum has no record of its presence in this State.

The following is a simplified key for the field identification of the fresh water crayfish of South-western Australia. The Yabbie has been included, on the remote chance that it might possibly be found as an inland species or in the streams that occur east of the known range of the Koonac.

**Marron**, *Cheraps tenuimanus*. Five ridges or keels on the back of the head. These include those forming the sides of the rostrum, or spike, on the front of the head. No mat of fine hairs on the upper surface of the inner portion of the hand (carpus).

**Jilgie**, *Cheraps quinquecarinatus*. Five keels on the back of the head as above. A mat of fine hairs on the upper surface of the inner portion of the hand.

In some instances the tomentose patch on the great claw of the Jilgie may be worn to such an extent as to be visible only under a lens. In these cases an additional means of identification is the number of serrations or teeth on either side of the rostrum. The Marron possess three or more, the Jilgie less than three.

**Koonac**, *Cheraps preissii*. Four ill-defined keels on the back of the head. A mat of fine hairs on the upper surface of the inner portion of the hand. Distance between the tip of the rostrum and the cervical groove (the deep groove that divides the carapace into two portions) twice that between the cervical groove and the posterior margin of the carapace.

**Yabbie**, *Parachaeraps destructor*. Four keels as above, a mat of fine hairs on the upper surface of the inner portion of the hand. Distance between rostrum and cervical groove one and a half times the distance between the cervical groove and the posterior margin of the carapace.

### 3.—DISTRIBUTION.

The precise original habitat of each of the three species cannot now be determined owing to indiscriminate introductions by persons unaware of the fact that there are three species. The Koonac was frequently introduced in the belief that it was the Marron. The

---

\*The type locality of *bicarinatus* is stated to be Port Essington, but Glaucert (1947) has pointed out that this is an error of labelling. There is no doubt that the type came from South-western Australia and was a Koonac. Unfortunately the name *bicarinatus* later became associated with the eastern States' Yabbie, for which Clark has proposed *destructor* as a replacing name. Thus the prior name for the Koonac is *bicarinatus* and not *preissii*, but I would suggest that the International Commission on Zoological Nomenclature place the name *bicarinatus* on a list of *nomina rejecta*, because its future employment for the Koonac is likely to cause endless confusion, as it has long been in use for the other related but separate species.

writer has found all three species in the same watercourse, the Serpentine River.

As yet, little is known of their respective ecological preferences.

The Western Australian Museum has specimens or records from the following localities:—

Marron: Rivers of the South-west from the Harvey and Collic in the north to the Hay River in the south-east (Mt. Barker district), and the King and Kalgan Rivers near Albany. It is known also from the Carrolup Brook, Correalup and Gordon Rivers. Introduced (date unknown) into the Murray, Serpentine and Canning Rivers, and has spread to the Swan River where it has been recorded at Guildford.

Jilgie: Yanchep, Chidlows, Gingin Brook, Moore River, Avon River system, Helena River, Mundaring, Canning River, Serpentine River, Englochpe, Harvey River, Vasse River, Yallingup Brook, Cranbrook.

Koonac: Guildford, Cannington, Jarrahdale, Harvey River (in billabongs), Katanning, Broomehill, Stirling Range, Tambellup, Williams River, Darkan, Kojonup, Busselton district, Manjimup, Calgardup Cave, Mammoth Cave, Gnowangerup, Ongerup (in salt water in a rock hole), Albany district in swamps.

Marron and Jilgies are only known from permanent waters, but Koonacs are frequently found in swamp lands where they have deep burrows to the water table. Koonacs found in peat swamps are blue in colour but otherwise are similar in structure and do not warrant sub-specific classification.

#### 4.—METHODS OF CAPTURE.

Two methods are in popular use for capturing Marron, the snare and the drop net.

The first, the snare, calls for little equipment but a great deal of care and patience. A thin stick is cut of a length great enough to reach to the bottom of the pool to be fished. To one end of the pole is fastened a flexible wire, usually bronze picture wire, and a running noose fashioned in the free end of the wire. The loop so formed is enlarged to three or four inches in diameter. Baits, commonly of raw meat, are lowered into the water, by means of a length of string, at various suitable locations and allowed to remain on the bottom.

The fisherman then moves around from position to position examining his baits, using a powerful lamp if it is after dark. When a worthwhile Marron is seen feeding at one of the baits the stick is pushed down into the water and the wire loop carefully manoeuvred over the crayfish's telson until it reaches the carapace, when a quick pull tightens the noose and the victim is hauled to the surface.

What is considered the less sporting way of making a catch is by the use of drop nets. These are fabricated from two heavy



gauge wire hoops, two to three feet in diameter, suspended one above the other with the vertical side and the bottom covered with fish net. A bait, which varies with the individual fisherman's idea of what might attract a Marron, is tied or fastened to the centre of the lower hoop, and the net lowered into the water from a convenient log or overhanging bank. At intervals the net is hauled rapidly to the surface, the catch removed, and the net replaced in the water.

The drop net method undoubtedly catches more crayfish than the snare but entails carrying bulky equipment to the scene of operations, sometimes for considerable distance through dense scrub.

Fixed traps or conventional craypots are not used to any extent owing to transport difficulties and concealment of their whereabouts when set.

There are no restrictions at present on the size of Marron that may be caught, nor any close season. There is, however, a prohibition on the sale of Marron, or any other fresh water crayfish, by other than licensed fishermen.

#### 5.—HABITS AND FOOD OF THE MARRON.

Jilgies and Koonacs can survive longer periods out of water than Marron, and also weather worse water conditions. Marron show signs of distress when the dissolved oxygen present in the water drops to 2.0 p.p.m. and die when it is reduced to 0.9 p.p.m. Marron have been kept alive several months in water containing only 4.0 p.p.m. of dissolved oxygen.

During these experiments it was noted that a native fish *Nannoperca vittata*, used as a control, was unharmed when the oxygen deficiency fell to the lethal point for Marron.

Marron will die more rapidly in oxygen deficient water than if they are completely out of the water. They will survive for more than 24 hours when wrapped in a wet bag, the popular way of keeping them alive while awaiting the pot. Tolerance levels of salinity and temperature are yet to be determined, but indications go to show that temperature is dependent on oxygen saturation point.

During heavy rains following bush fires large numbers of Marron leave the water to fall victims to predators such as water rats, birds, etc. Kookaburras have frequently been seen by the writer catching small Marron and other species, then flying off to a tree and smashing them up by hitting them against a limb.

Marron inhabit the lower reaches of the rivers and are not normally found in the very small feeder streams in any quantity or at any large size. They are most commonly found in pools and streams with a mud or silt bottom and do not have the burrowing tendencies so strongly developed as the Jilgie or Koonac. They seem more content to seek shelter under logs or stones in the bed of the streams. Although primarily nocturnal creatures they may frequently be seen in daylight foraging in an endeavour to satisfy their rapacious appetites. Food values are low in the South-western



There has been considerable controversy regarding possible depletion of the Marron stocks by the introduction of a large exotic carnivore such as the Trout. Observation of both creatures, so far, leads the writer to believe that the opposite is more likely to occur. Trout, Perch (*Perca fluviatilis*), Gallop (*Plectroplites ambiguus*), Murray Cod (*Maccullochella macquariensis*), Carp (*Carassius auratus*) and other fish have been released in various streams throughout the South-west since 1890, but, unless the stock is maintained artificially, the species tend to disappear, and only occasional specimens caught.

The Marron, together with the Koonac and Jilgic, appear to be the successful competitors for the scanty food supplies in the South-western streams. Crayfishes, with their method of feeding by exploring the detritus on the bottom with their chelate limbs and with their ability to move fairly large stones and other debris with their great claws, can capture a large number of insect larvae and other water creatures that fish, particularly trout, would take in their free-swimming or emergent stages only.

Stomachs of trout occasionally contain the remains of crayfish, but since the trout captures its food mainly by sight, and the crayfish is primarily a nocturnal creature, the number of Marron destroyed by trout is probably considerably less than that removed by other predators. In New Zealand where natural food values are considerably higher, Mr. G. Stokell informs me he has found crayfish in the stomachs of three trout only in the several thousand examinations he has made.

If unrestricted fishing depletes the stocks of large Marron, leaving only small and immature creatures, the above statements may have to be reviewed.

As far as has been observed the Marron do not display aggressive tendencies towards each other or other species. The use of the great claws apparently is confined to moving large objects, defence, and the carrying of food particles too large to be consumed on the spot.

#### REFERENCES

- Clark, E. (1936), "Freshwater and Land Crayfishes of Australia," *Mem. Nat. Mus. Victoria*, no. 10. pp. 5-58.
- Clark, E. (1937), "The Life History of the Gippsland Crayfish," *Austr. Mus. Mag.*, vol. vi., pp. 186-192.
- Glauert, L. (1947), "Some Unfortunate Errors in Collecting Localities," *W.A. Naturalist*, vol. i., p. 48.
- Hale, H. M. (1927), "Crustaceans of South Australia," pt. 1.
- Huxley, T. H. (1880), *The Crayfish*, International Scientific Series xxviii.
- McCulloch, A. R. (1914), "Revision of the Freshwater Crayfishes of South-western Australia," *Rec. W.A. Mus.*, vol. i., pp. 228-235.
- Millet, C. (1870), *La Culture de L'Eau*, Tours.
- Smith, G. W. (1912), "The Freshwater Crayfishes of Australia," *Proc. Zool. Soc. London*, vol. i, pp. 144-170.

(To be continued)